**Assignment 3**

**Revisited: Fundamental Frequency Detection/Pitch Tracking**

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**A2.** If the block size=1024, the resolution is 44100 Hz/1024 = 43 Hz. Frequency reassignment, for example a constant Q transform, could be used to improve the resolution without changing the block size.

**E1.**

**Figure 1. Estimated F0 for Max FFT Method (blockSize = 1024)**

**Figure 2. Absolute Error for Max FFT Method (blockSize = 1024)**

**Figure 3. Estimated F0 for HPS Method (blockSize = 1024)**

**Figure 4. Absolute Error for HPS Method (blockSize = 1024)**

Discussion:

The HPS method fails for this signal because…

**E2.**

**Figure 5. Estimated F0 for Max FFT Method (blockSize = 2048)**

**Figure 6. Absolute Error for Max FFT Method (blockSize = 2048)**

Discussion: improvement in performance?

**E3.**

**Table 1. Average performance metrics for Max FFT method**

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **False Positive Rate** | **False Negative Rate** | **RMS Error (Cents)** |
| Max FFT |  |  |  |

**E4.**

**Table 2. Average Performance Metrics for HPS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **False Positive Rate** | **False Negative Rate** | **RMS Error (Cents)** |
| HPS |  |  |  |

**E6.**

**Table 1. Average Performance Metrics by Method using Voicing Mask**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Method** | **Voicing Mask Threshold** | **False Positive Rate** | **False Negative Rate** | **RMS Error (Cents)** |
| Max FFT | -40 |  |  |  |
| HPS | -40 |  |  |  |
| ACF | -40 |  |  |  |
| Max FFT | -20 |  |  |  |
| HPS | -20 |  |  |  |
| ACF | -20 |  |  |  |